are now presented, will no doubt tend to convey a strong impression of great and rapid changes undergone by the *nebula itself. I am far from participating* in any such impression. Comparing only my own drawings made at epochs (1824 and 1837) differing by thirteen years, the disagreements, though confessedly great, are not more than I am disposed to attribute to inexperience in such delineations (which are really difficult) at an early period—to the far greater care, pains, and time bestowed upon the later drawings. . . . Now there is only one particular on which I am at all inclined to insist as evidence of change, viz., in respect of the situation and form of the *nebula oblongata*, which my figure of 1824 represents as a tolerably regular oval. . . . No observer now, I think, looking ever so cursorily at this point of detail, would represent the broken, curved, and unsymmetrical nebula in question . . . as it is represented in the earlier of the two figures."

The enormous body of work done even in Sir J. Herschel's time, chiefly by Lassell, Bond, Liaponoff, Struve, and Lord Rosse, is so fully recorded that it is impossible to do more than refer to it in the space at our disposal, besides which much of it is so recent as to be still in the minds of all interested in such questions. But Mr. Holden, in his work on the nebula, has not contented himself with discussing this work merely. The Washington observations made by himself are given, and cover nearly 100 pages.

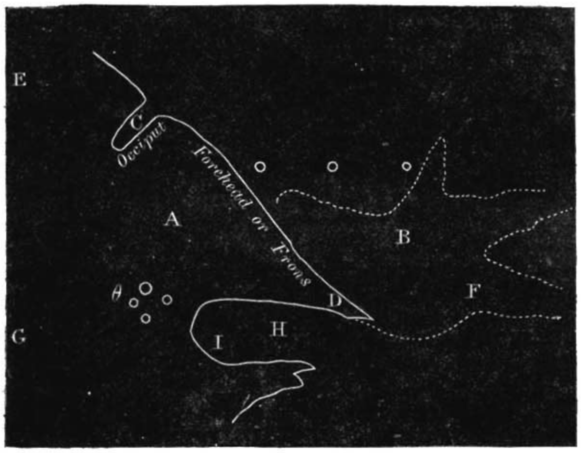

FIG. 2.—Sketch Map of the Huyghenian Region.—A, the Huyghenia (brightest) region; *θ*, the four stars of the Trapezium; B, subnebulou region; C, Sinus Gentilii; D, Rostrum; E, Regio Gentiliana; F Regio Messieriana—Brachium Messieri, Proboscis Major; G, Regio Derhemiana; H, Sinus Magnus; I, Schrœter's Bridge.

We may now deal with the results arrived at. Prof. Holden considers the evidence of change undoubted, but such change depends less upon actual change of form than upon shiftings of the maxima of brightness. The most undoubted changes are in the brightness of the first and second Schrœter's bridge, and in the appearance of the nucleus of the first. The changes in the brightness of some of the masses are established by the Washington observations alone. Among the results of these observations is a new nebulous patch seen from the time of its origin, when it was stellar in appearance, and faint, until now, when it is bright, and of measurable dimensions.

Another matter investigated by Prof. Holden is the question of the connection of the stars with the nebula. On this point spectroscopic work is brought upon the scene. The spectrum of the nebula was first studied by Huggins. The gaseous nature of some of the small stars near the trapezium is, Prof. Holden thinks, indicated by their peculiar behaviour under different magnifying powers; some of them are best seen with low powers.

The question of photography is introduced in an appendix giving the results obtained by the late Dr. Draper just before his lamented death. This photograph was exposed for 137 minutes, and, as may be easily imagined, lacks sharpness, but still, as Prof. Holden puts it, it worthily inaugurated nebular-photography. He also clearly pointed out that, since the eye and the salts of silver do not most strongly respond to light of the same wave-lengths, the intensities of drawings and photographs must vary, and he shows that they do vary. On the other hand, it is shown that the untouched photograph defends the best drawings against the charge of depending too much upon the personal equation of the observer, as over large regions the best drawings are justified by the photograph.

Mr. Common's photograph, a reproduction of which we give, is far finer than Dr. Draper's, among other reasons because it was exposed for about one-third the time. It is to be hoped that we shall have photographs as good as this taken for the future every year, not only on plates responding to blue light, but on plates responding to green and red. In this way most precious records will be secured for future discussion.

On this question we may make the following quotation from Mr. Common's communication to the Royal Astronomical Society:—

"To find if there is any change of form or relative brightness observable in a nebula with any degree of certainty, it will be necessary to compare photographs taken at some undetermined interval of time; and the best thing to do now seems to me to be to get as many photographs as possible to form the basis of comparison with those taken at some future time; and this I am now doing. . . .

"The light of this nebula is so different in intensity that for a proper exposure of the outer portions the central part is much over-exposed; it is therefore necessary to take photographs with different exposures. Thus an exposure of from one to three minutes gives the brighter portions of the central parts in such a way that they can be easily compared and their order noted; longer exposures giving portions less bright in a similar way, till, with a maximum exposure, the very faintest portions can be compared and noted in order. The stars in the nebula can be treated in the same way, the same photographs being available."

We have before referred to the fact that many of the stars in and about the nebula are variable, particularly the faint ones. Mr. Common has found that one of the brighter stars is remarkably variable, though what its period is he has not yet determined

As the time of exposure can be easily extended to hours, it will evidently in the not distant future be easy to get stars invisible to the eye in the same telescope used for photography.

NOTES

AMONG the gold medals awarded by the juries of the International Fisheries Exhibition are the following in the department of Natural History:—INVERTEBRATA.—United Kingdom: James Cook, the Duke of Edinburgh, Prof. McIntosh, Thos. Bolton. Italy: Dr. Dohrn (2). Netherlands: Netherlands Zoological Society. United States: United States Fish Commission. New South Wales: Sydney Museum. Sweden: F. B. Wittrock, Baron Nordenskjöld, W. Lilljeborg. Russia: Dr. Oscar Grimm. FISH, &c.—United States: United States National Museum, United States Fish Commission, Prof. Alexr. Agassiz, Prof. G. Brown-Goode, Prof. David S. Jordan. New South Wales: Australian Museum, Sydney (2); New South Wales Commission, Hon. W. Mackay, E. P. Ramsay. Sweden: the Royal Swedish Academy, Dr. Oscar Dickson. Canada: Canadian Government. China: Government of.

Norway: the Government Geographical Survey. Tasmania: Commissioners of Fisheries. United Kingdom: Dr. F. Day (2), the Princess Louise, Rd. Collett, Dr. Francis Day, Mrs. Bleeker, Arthur Grevenstuk. Sweden: Prof. Baron A. E. Nordenskjöld, Prof. F. A. Smith, W. von Wright. Denmark: H. V. Feilder. Norway: Prof. G. O. Sars, Prof. H. Mohn. MAMMALS, BIRDS, &c.—India: Bombay Museum. Canada: Canadian Government. United States: United States Fish Commission. Sweden: Oscar Dickson, Stockholm Museum, Baron Nordenskjöld.

BEN NEVIS OBSERVATORY was duly "inaugurated" on Wednesday last week amidst a snowstorm. The ceremony passed off successfully, Mr. Murray formally accepting from Mrs. Cameron Campbell, the proprietress of the ground on which the Observatory is built and over which the road is made, the key of the buildings, which all present seemed to think well adapted for their purpose.

THE Home Secretary has acquainted the Meteorological Society that Her Majesty has been graciously pleased to grant it permission to adopt the prefix "Royal." The Society accordingly becomes the "Royal Meteorological Society." To all workers in meteorology, whether Fellows of that society or not, this public recognition of the importance of the science cannot but be most gratifying.

PROF. EDWARD HULL, F.R.S., Dr. E. Hull, and Mr. H. Hart have left London for Suez, under the auspices of the Palestine Exploration Society, to explore the valley of the Jordan. At Suez we understand that the party will have the advantage of the experience of a member of the firm of Messrs. Cook, under whose guidance the expeditionary party are then to proceed. During Prof. Hull's absence from Ireland the lectures on geology in the Royal College of Science, Dublin, will be delivered by Mr. A. B. Wynne, late deputy superintendent of the Geological Survey of India.

IT is suggested that the memorial to the late Prof. Jevons might take the form of a studentship, of the annual value of not less than 100*l*., the holder of which shall devote himself to economic or statistical research; and that to commemorate the connection of Jevons with Liverpool, in which he was born, and with Manchester and London, in which so many of the best years of his life were spent, the election to the studentship be vested in representatives of University College, London, Owens College, Manchester, and University College, Liverpool, to be appointed for the purpose. Among the members of the committee formed for the purpose of forwarding the proposed memorial are—the Duke of Devonshire, the Duke of Westminster, the Marquis of Hartington, M.P., the Earl of Derby, the Earl of Kimberley, the Bishop of Manchester, Lord Windsor, Mr. Chamberlain, M.P., Sir R. Cross, M.P., Sir Charles Dilke, M.P., Mr. Childers, M.P., Mr. Fawcett, M.P., Mr. Mundella, M.P., Sir J. Lubbock, M.P., Sir T. Brassey, M.P., Mr. J. Cross, M.P., Mr. L. Courtney, M.P., Mr. Robert Giffen, Prof. T. E. Thorpe, Prof. Caird, Prof. J. S. Nicholson, Mr. W. Knight, Prof. Marshall, Principal Edwards, Principal Peterson, Rev. R. Harley, Prof. W. Dallinger, Prof. Adamson, Prof. Roscoe, Prof. Balfour Stewart, Prof. W. Wallace, Prof. G. H. Darwin, and Prof. G. Carey Foster. Subscriptions may be paid to the credit of the treasurer of the Jevons Memorial Fund, with the Manchester and Salford Bank (Limited), and will be received, among others, by Messrs. Williams, Deacon, and Co., London.

AN improvement so useful and suggestive as to deserve notice in these columns, has been recently applied by the proprietors of "Bradshaw's Railway Guide" to the map of Great Britain which accompanies that indispensable manual. It consists in ruling meridian lines at every $1\frac{1}{4}^\circ$ of longitude, or every 5m. of time from Greenwich, so as to show at a glance, sufficiently nearly for practical purposes, the difference between the local time at every town in the United Kingdom, and Greenwich or railway time. The difference, it is true, is small enough to be neglected in the eastern counties; but is considerable enough to require to be remembered in the western half of these islands. A traveller leaving Falmouth by night train with an appointment in London for 10 a.m. the next morning, may be much inconvenienced if he forgets that 9h. 40m. by his watch is 10 a.m. for his purpose. We have only to suppose our traveller to be going from New York to Chicago or from Paris to Vienna, to see the great convenience of this unobtrusive addition to railway maps. But there is another advantage which will be realised whenever these time meridians replace meridians of longitude on school maps, as they are bound to do by degrees. It is that they tend to give clear ideas of longitude, of the earth's diurnal revolution, of time itself. Meridians, as such, are mere coordinates of position, and have no necessary connection with time, and the ideas of many even educated people are extremely hazy on their mutual relations. Messrs. Blacklock of Manchester probably make no pretension to be educational reformers, but in taking the initiative in this improvement, they are in fact, thanks to the great circulation of "Bradshaw," helping to prepare the public mind for the adoption of a universal first meridian, and giving great assistance to the schoolmaster.

THE red spot on Jupiter continues to be well visible. Mr. W. F. Denning writes that on the mornings of October 16 and 18 he observed the spot with a 10-inch reflector, power about 212, and found it a tolerably easy object, though it is very much fainter than the belts. At times the shape of the spot could be distinctly made out notwithstanding the constant vibration of the telescope by the high wind prevailing. Mr. Denning adds that with favourable atmospheric conditions this marking ought to be an easy object for telescopes above 6 inches aperture.

THE only changes proposed to be made in the constitution of the Council of the Mathematical Society for the ensuing session are the substitution of Messrs. W. D. Niven, F.R.S., and J. Hammond, M.A., in the place of Mr. C. W. Merrifield, F.R.S. (who, we regret to say, is obliged to resign on account of ill health), and Dr. J. Hopkinson, F.R.S.

SCIENCE CLASSES have been established in Warwick during the past week. A largely attended public meeting was held on the 16th, under the presidency of the mayor, when an address on the value of science teaching was delivered by the Rev. W. Tuckwell. Fifty names were announced for an immediate chemistry class; and it was proposed to form general classes in geology or botany, with a special working-men's class in practical geometry and elementary mechanics.

MR. J. G. BAKER of the Kew Herbarium, the president of the Yorkshire Naturalists' Union, who has already written floras of North Yorkshire and of Northumberland and Durham, is intending to print this winter a flora of the English Lake District, on which he has been long engaged, and will be glad to receive any contributions towards it.

FROM *Science* we learn that a number of gentlemen met in the library of the American Museum of Natural History in New York City, on September 26 to 28, and founded the American Ornithologists' Union. The membership consists of active, foreign, corresponding, and associate members. The active membership is limited to fifty residents of the United States and Canada; the foreign, to twenty-five non-residents of the United States and Canada; the corresponding, to one hundred residents of any country; the associate being composed of any number of residents of the United States and Canada. The officers of the

Union for the current year are: Mr. J. A. Allen, president; Dr. Elliott Coues and Mr. Robert Ridgway, vice-presidents; Dr. C. Hart Merriam, secretary and treasurer; Messrs. S. F. Baird, George N. Lawrence, H. W. Henshaw, and Montagu Chamberlain, councillors—these nine officers constituting the Council of the Union. The work of the Union for the present year was laid out by the formation of committees on the subjects of classification and nomenclature, of the distribution and migration of birds, of avian anatomy, of oology, and on the question of the eligibility or ineligibility of the European sparrow in America. The first-named committee, besides revising the current lists of North American birds, is expected to consider the subject of zoological nomenclature at large, and its labours may result in the formation of a code of nomenclature applicable to other departments of zoology, as well as to ornithology. It consists of Messrs. Ridgway, Allen, Brewster, Henshaw, and Coues.

The following telegram from Lieut. Ray, commanding the Point Barrow observing party, appears in the American papers:—"San Francisco, October 7, 1883.—I report my safe arrival here to-day with party. Also brought down Lieut. Schwatka and party from St. Michaels. All work accomplished as ordered by chief signal-officer. Pendulum observation not made. *Leo* reached Ooglaamie August 22; was driven away by ice the same night; returned on the 24th; again driven away and damaged on the 25th; returned on the 27th, when party and stores were embarked; sailed on the 29th, vessel leaking badly; put into Unalaska, where she was beached and repaired."

The *Dijmphna*, which we announced last week had arrived at Vardö, got free of the ice the day after the members of the Dutch meteorological expedition departed, but having the misfortune of breaking the blades of her propeller she became unmanageable, and was again frozen in for about six weeks. At last, on September 13, the vessel again became free, when Hovgaard succeeded in a week, by sailing and towing, in reaching the Kara Straits, after having passed through ice for some 120 miles. In the latter locality he weathered a terrific storm, and it was first on September 21, in 71° 17′ lat. and 55° 52′ long., that the vessel got quite clear of the ice, viz. half way between the Kara Straits and Vardö, where she arrived after a sixteen days' stormy journey. After repairing here the *Dijmphna* will proceed to Copenhagen. Lieut. Hovgaard and Dr. Holm have made some valuable scientific discoveries and collections during their wintering in the Kara Sea, of which locality a map has also been made.

The new island which the Dutch Meteorological Expedition discovered near Waigatz Island, is situated in 70° 25′ 28″ lat., and has been named Buys-Ballot Island, after the eminent Dutch meteorologist of that name.

The expedition despatched by Mr. Sibiriakoff, the Russian merchant, under Mr. R. J. Runeberg, in order to explore the River Angara, between Irkutsk and Yeniseisk, a distance of 1700 versts, has recently returned to St. Petersburg. For several years little ships, chiefly loaded with tea, have sailed down the river, and last year even a small steamer passed down, but shallow rapids have hitherto prevented vessels proceeding up the river. Mr. Runeberg reports that the latter can easily be removed, and a regular trade on the River Angara may therefore soon be looked forward to.

The native town of M. Pasteur has done honour to the eminent biologist by placing a plate on the house where he was born, commemorating the fact.

Very few lake-dwellings have hitherto been found in England, and therefore the recent discovery of what seem well-preserved relics of such structures at Ulrome, Holderness, Yorkshire, is of unusual interest. An article in the *Standard* of October 20 describes what has already been done to bring the remains to light, and ascribes the structures and their contents to the early part of the Neolithic age and downwards to the Bronze age.

Mr. Leonard Courtney, M.P., speaking at the distribution of the Science and Art prizes at Penzance last week, dwelt strongly on the benefits likely to accrue to the nation from the general study of science. He hoped the study of science would become such that even statesmen might feel the folly of endeavouring to work against the laws of nature.

The general monthly meetings of the members of the Royal Institution of Great Britain will be resumed on November 5, at 5 p.m., for the election and nomination of members and the election of a manager in the room of the late Mr. William Spottiswoode, P.R.S.

Mr. Clement L. Wragge, late of Ben Nevis Observatory, sailed on the 18th inst. for Adelaide on the s.s. *Maranoa*. He takes a large equipment of meteorological, surveying, and astronomical instruments, including a fine equatorial telescope. The voyage will be made a scientific one in every possible way, and important results may be expected.

We understand that the Committee appointed by the Lord Lieutenant of Ireland to inquire into the administrative arrangements of the Board of Intermediate Education will meet in Dublin this week. The Committee consists of Sir R. Kane, Col. Donnelly, R.E., and Mr. R. W. A. Holmes.

Shocks of earthquake were felt at a quarter to one o'clock on Friday night at Huelva, Cadiz, Medina Sidonia, Jerez, and other districts of Andalusia along the ocean coast. The movement was from east to west. Telegrams from Huelva and Cadiz say a rumbling noise accompanied the earthquake, which is said to have lasted three seconds in some places, and five seconds in others. In Cadiz the shock is described as strong enough to move doors and bells. The weather, which was unusually wet with cold winds early in October, had lately become very mild and warmer in the south of Spain. Several slight shocks of earthquake were felt on Saturday morning in Lisbon. A shock of earthquake, lasting three seconds, was felt at Tangier at half-past one on Saturday morning. Two shocks of earthquake were felt on Monday morning at Belluno, at the foot of the Dolomite Mountains. The first was at 3.35, the second at 4.15 a.m. Much alarm was caused, but no damage was done. It will be remembered that Belluno suffered great destruction from the earthquake of June 29, 1873. A slight shock of earthquake was felt at Malta at two o'clock the same morning. A slight shock, attended by an undulatory motion, was also felt at Trieste at half-past three the same morning. A despatch received by the Admiralty, dated Tchesme, October 21, states that slight shocks of earthquake continue, but do not cause more damage. Eleven towns and villages have been damaged or destroyed. Lyddia, Eritra, Reisderch are in total ruins. Tchesme, Latyalka much damaged. About 90 people were killed, 200 wounded, and 3600 houses destroyed.

Mr. H. Cecil of Bregner, Bournemouth, writes under date October 22:—"I perceived here on the morning of the 10th inst., just before the light was sufficient to show the hands of a watch, two distinct tremors of earthquake. A whatnot by my bedside trembled throughout, and a watch on its stand vibrated with a strong and regular pulsation. Nothing was passing at the time, and a heavy steam-roller has passed one morning since without affecting the whatnot or the watch."

A telegram from Calcutta of date October 22 states that Mr. Graham and his Swiss guides returned to Darjeeling on the previous evening. He pronounces the ascent of Kinchinjunga from the south impracticable; but he has succeeded in ascending another mountain 24,000 feet high.

THE *Sanitary Engineer*, which has for some time been published in New York, is now to be published simultaneously in England and America.

DR. KING'S annual report on the Government Cinchona Plantations in Bengal for the year 1882-83, which is dated May 11 last, is a review of the work in the plantations down to March 31. The planting operations of the year show a grand total of cinchona trees on the Government estate at the last-mentioned date of 4,711,168 of all sorts; this is a decrease, we are told, of about 50,000 on the returns of the previous year, the falling-off being due to the uprootal of 20,000 hybrids, and 43,697 *Calisayas*, which were shown on analysis to have bark of rather poor quality. Dr. King says: "The removal of these inferior trees is in conformity with the policy which has been followed for some years of raising the standard of the produce of these estates by cultivating only the finest kinds of quinine yielders. In conformity with the same policy 160,085 red bark trees, which had to be uprooted in the ordinary rotation followed on the plantation, were replaced, not by red barks, but by yellow barks and hybrids. Ground was, towards the end of the year, broken at Runjung, in the new cinchona reserve across the Tiesta. A European assistant has been located there, and preliminary measures have been taken for planting out there, during the year now entered upon, a number of the best kinds of *Ledgeriana* and hybrid cinchonas." Regarding the crop of bark harvested during the year, Dr. King says it was the largest ever obtained from the plantations, and amounted to 396,980 lbs. of dry bark, 38,880 lbs. of which were collected on the young plantation at Sittong, and the remainder on the old plantation. The total crop was divided as follows: 372,610 lbs. of *Succirubra*, 22,120 lbs. of *Calisaya* and *Ledgeriana*, and 2250 lbs. of hybrid bark. The bulk of the crop was made over to the factory for conversion into cinchona febrifuge, 41,800 lbs. being sent home by order of the Secretary of State to be converted, it is understood, into various forms of cinchona febrifuge in this country for trial by the medical department. It seems that the plants yielding Carthagena bark have not thriven, only three plants being alive at the end of the year, and this notwithstanding every care that could possibly be given to them. The quinologist's report for the same period as the preceding is appended to it, and it shows that the net result of the manufacture of febrifuge for the year was 10,363¼ lbs. of ordinary and 300 lbs. of crystalline febrifuge, the cost price of which was lower than in any previous year. It appears that the year's working resulted in a profit of Rs. 66,284.9.5, which, it is stated, is equal to a dividend of 6½ per cent. on the capital, and may be considered satisfactory. On this point Dr. King says: "The quantity of febrifuge supplied to Government departments during the year was 4180½ lbs., and the cost was Rs. 68,988.8, an equal quantity of quinine at Rs. 96 per lb. would have cost Rs. 4,01,328. The saving to the State effected by substituting febrifuge of Government manufacture for English-made quinine was therefore Rs. 3,32,340."

MR. CHARLES F. PARKER, the curator in charge of the Academy of Natural Sciences of Philadelphia, died September 7, after an illness of several months. Mr. Parker had paid special attention to the botany of New Jersey, and, both in the completeness of his herbarium and the accuracy of his knowledge of it, he had few, if any, equals.

MR. F. E. SAWYER sends us reports of two papers in which he gives the results of his investigations on the folk-lore and superstitions of Sussex. There is also a paper by him in Part vii. of the *Folk-lore Journal* on St. Swithin and the rain water. The same number contains part 6 of Mr. Sibree's valuable collections on "The Oratory, Songs, Legends, and Folk-tales of the Malagasy."

AT the Upsala University a young lady, only seventeen years of age, has just taken the first degree of examination.

THE additions to the Zoological Society's Gardens during the past week include two Bonnet Monkeys (*Macacus sinicus* ♂ ♀) from India, presented by Mr. John Verinder; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. W. H. B. Morris; a Bonnet Monkey (*Macacus sinicus*) from India, presented by Miss Stokes; a Geoffroy's Cat (*Felis geoffroii*), a Chilian Sea Eagle (*Geranoætus melanoleucus*) from Uruguay, presented by Mr. Charles S. Barnes; a Crested Porcupine (*Hystrix cristata*) from Africa, presented by the Earl de Grey; a Purple Gallinule (*Porphyrio cæruleus*), European, presented by Mr. Robert Dowling; a Golden-headed Conure (*Conurus auricapillus*) from South America, presented by Mrs. Robins; a Smooth Snake (*Coronella lævis*), British, presented by Mr. W. H. Pain; an Æsculapian Snake (*Coluber æsculapii*), European, two Redshanks (*Totanus calidris*), British, a Yellow Baboon (*Cynocephalus babouin*), a Gambian Pouched Rat (*Cricetomys gambianus*), a Slaty Egret (*Ardea gularis*) from West Africa, a Little Egret (*Ardea garzetta*), European, a Very Black Lemur (*Lemur nigerrimus* ♂) from Madagascar, purchased; a Brown Bear (*Ursus arctos*), North European, a Puma (*Felis concolor*) from America, a Patas Monkey (*Cercopithecus patas*) from West Africa, two Black-footed Penguins (*Spheniscus demersus*) from South Africa, a Cocteau's Skink (*Macrocincus cocteauii*) from the Cape Verde Islands, deposited.

OUR ASTRONOMICAL COLUMN

PONS' COMET.—Several observers have drawn attention to a remarkable fluctuation in the brightness of this comet in September. M. Bigourdan of the Paris Observatory says that on the 5th of that month it appeared as a faint nebulosity about equal in brightness to a star of the twelfth magnitude, and nearly round. On the 9th, with a power of 500, there was a small nucleus, ill defined but sufficiently distinct from the surrounding nebulosity; the comet's light had increased since the 5th. Moonlight and clouds interfered with observation till the 23rd, when the brightness was much increased, and in a small telescope was equal to that of a star of the eighth magnitude. On the following night, in a fine sky, the comet's aspect was still the same, and its diameter was nearly 2′. On the 27th a considerable change had taken place; the nebulosity was much fainter, and the nucleus distinct from it was from 10–11m. After that date the nucleus further diminished, and on October 6 was only of 12m., though the comet as a whole was more easily seen than at the beginning of September. Thus on September 24 the comet was of 8m., while its brightness, calculated from that of September 5, would have assigned it only 11–12m. It therefore had, as M. Bigourdan remarks, for some time a brightness thirty to forty times that given by theory, which, he says, it is difficult to reconcile with the opinion that comets have not a light of their own.

Herr Rumker, observing at Hamburg, noticed similar variation. On September 23 he had seen the comet as "ein sehr helles Object mit einer glanzenden Verdichtung." On September 27 and following nights, "glich der Comet einem sehr blassen, unregelmässigen, ziemlich grossen Nebel mit einem Kleinen kaum sichtbaren condensations-centrum." The contrast, he says, was so striking that on September 27 he at first doubted if he had the comet in the field.

Baron von Engelhardt found the comet fainter on October 1 than on September 28, but on the latter night it was much better seen with a 5-inch comet-seeker than with a power of 140 on the equatoreal.

THE GREAT COMET OF 1882.—The weather during the last moonless period appears to have been very unfavourable, at least in this country, and there was no opportunity for satisfactory examination of the position of the great comet of 1882, on the chance of glimpsing it with our larger instruments as the earth somewhat overtook it on its course. The theoretical in-